PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in or relating to Valves, Plug Cocks or Bib Taps

We, G. N. HADEN & SONS, LIMITED, a British Company, HENRY HOPE BRUCE, ERIC HARRISON and JOHN RICHARD PATERSON, all British Subjects, and all of 19—29, Woburn Place, London, W.C.1, do hereby declare the nature of this invention to be as follows:—

The present invention has reference to improvements in or relating to valves, plug cocks or bib taps and comprises the following features:—

(a) A tapered metal plug having a passage for the flow of fluid, turning in a tapered sleeve liner or lining having inlet and outlet apertures and made of any suitable rigid, self-lubricating material, the flow of fluid being controlled by the rotation of the plug.

(b) A shaped extension of the inlet and/or outlet port of the passage in the plug or a plug providing a graduated throttling effect as the said plug is turned toward the closed position.

(c) A spindle which is hollow for the greater part of its length and is joined at the sealed end to the moving valve part, plug or the like and at its open end registers with a hand wheel or similar turning device.

The sleeve, liner or lining in which the plug turns may be formed from a compound of metal and graphitic carbon amalgamated by a suitable process, or a combination of other suitable constituents providing a rigid body which has (or can be provided with) a tapered bore, a self-lubricating surface and a port or ports for the flow of fluid. If desired the liner or lining may be made of paste or cement, such as paste or cement containing steatite, worked to shape before or after being applied to the valve body.

The passage through the tapered plug may be straight or the inlet and outlet may be at an angle. In one form the plug is hollow with fluid inlet at the larger, open, end, and has a side outlet, fluid pressure and a spring together providing the necessary pressure at the interface of plug and sleeve to ensure tight shut-off, and reducing to a minimum the tendency for leakage at the gland in which the spindle turns.

The hollow spindle is designed to act as a thermometer well, so that water, oil or other suitable liquid in the bottom of the well in which a thermometer bulb or the like can be immersed takes up a temperature closely approaching that of the fluid flowing through the valve or cock.

The open end of the spindle may have a dust cover which is either hinged or removable and is held in place by a spring clip.

The handwheel or other suitable turning device is preferably not directly fixed to the spindle but while transmitting rotational movement does not transmit thrust which might part or produce clearance between the plug and sleeve and possibly admit grit or other foreign matter between the faces. Flat surfaces on the outside of the spindle register with flat surfaces on the inside of the hole in the handwheel or its equivalent and a pin, screw, or the like projects into a socket or pocket formed on the underside of the turning device and thence into a suitable recess on a relatively stationary part of the valve body. A spring causes the pin to engage with the edge of the recess remote from the plug or moving part of the valve proper and when pressure is exerted on the handwheel the pin contacts the opposite edge of the recess, or some part or extension of the handwheel contacts the relatively stationary valve body in a lesser distance than that required to transmit thrust to the spindle.

In another arrangement the handwheel or turning device is removed when access is required to the thermometer well. Rotation with limited thrust is achieved by means akin to those described above.

The features described above may be employed separately in a valve, plug cock or bib tap.

[*Price* 1/-]

Dated this 23rd day of May, 1946.

MEWBURN, ELLIS & CO.,
70 & 72, Chancery Lane, London, W.C.2,
Chartered Patent Agents.

COMPLETE SPECIFICATION

Improvements in or relating to Valves, Plug Cocks or Bib Taps

We, G. N. HADEN & SONS, LIMITED, a British Company, HENRY HOPE BRUCE, ERIC HARRISON and JOHN RICHARD PATERSON, all British Subjects, and all of 19—29, Woburn Place, London, W.C.1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention has reference to improvements in or relating to valves, plug cocks or bib taps.

A difficulty that arises in regulating heating systems is that the amount of regulation required is not known in the first place under present methods and can only be ascertained by trial and error unless a surface thermo-couple is used. Such an instrument, however, is unsuitable for use in unskilled hands. In order to be able to make full use of a valve having suitable regulating characteristics it is necessary to have some indication of relative rates of flow.

The temperature drop in a radiator can readily be obtained if radiator valves on flow and return have hollow spindles which can serve as thermometer pockets. With a given water inlet temperature the outlet water becomes cooler as the flow is reduced. It is a simple matter, therefore, to tabulate once and for all what valve setting is required to increase the temperature drop to the desired amount if the performance characteristic of the valve is known.

In accordance with the present invention we provide a valve, plug cock or bib tap having a hollow spindle to receive a thermometer with or without fluid for conduction, the hollow in the spindle being separated from the fluid passage of the valve by a wall of conducting material which has no axial movement in relation to the valve as a whole.

The hollow spindle is designed to act as a thermometer well, so that water, oil or other suitable liquid in the bottom of the well in which a thermometer bulb or the like can be immersed takes up a temperature closely approaching that of the fluid flowing through the valve or cock.

The accompanying drawings illustrate two forms of valve made in accordance with the present invention:—

Fig. 1 is a front elevation, part sectional;

Fig. 2 is a sectional side elevation; and

Fig. 3 is a plan of a handwheel valve;

Fig. 4 is a part sectional elevation of a key operated valve with cover.

As illustrated in Figs. 1, 2 and 3, a tapered metal plug *a* has a passage *b* for the flow of liquid. The plug *a* turns in a tapered sleeve liner *c* or lining formed from a compound of metal and graphitic carbon by a suitable process or a combination of other suitable constituents, such as paste or cement containing, e.g. steatite, providing a rigid body. The sleeve liner or lining *c* has a tapered bore *d*, a self-lubricating surface *e* and inlet port *f* and lateral outlet port *g* for the flow of liquid. The fluid inlet *f* is at the larger open end.

As an alternative to a tapered sleeve liner we may coat the plug with a self-lubricating metallic substance.

About the hollow plug spindle *h* there is arranged a helical spring *i* which at the end abuts a disc *j* held against upward pressure by a ring *k* lodged in an annular recess *l* in the spindle *h* and at the other end abutted on an inwardly turned flange *m* of a cup *n* screwed into the threaded upper part *o* of the valve housing *p* forming part of the gland *p*, *q*.

Fluid pressure and the spring *i* together provide the necessary pressure at the interface of the plug *a* and sleeve *c* to ensure tight shut-off and reduction to a minimum of the tendency for leakage at the glands *p*, *q* in which the spindle turns.

The upper part *q* of the said gland is also screwed into the aforesaid upper part *o* of the valve housing. The gland is sealed by a plug and screwed cap *r*, *s*.

The plug spindle *h* is hollow for the greater part of its length and is joined at the sealed end to the moving plug *a* and at its open end registers with a handwheel h^1 to which it is secured by a tongue and slot arrangement h^2, h^3, h^4, the tongues h^2 being held in slots h^3 by means of rings h^5 secured in annular slots h^{10} in the spindle.

As an alternative the handwheel may be fixed directly to the spindle.

The hollow spindle *h* is designed to act as a thermometer well so that water, oil or other suitable liquid in the bottom of the well in which a thermometer bulb or the like can be immersed takes up a temperature closely approaching that of the

fluid flowing through the valve or cock.

The open end of the spindle has a removable screw dust cover h^6.

As illustrated in Fig. 4 the arrangement is applied to a key operated valve with a key-hole at h^7, a pointer at h^8 and a cover at h^9.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A valve, plug cock or bib tap having a hollow spindle to receive a thermometer with or without fluid for conduction, the hollow in the spindle being separated from the fluid passage of the valve by a wall of conducting material which has no axial movement in relation to the valve as a whole.

2. A valve, plug cock or bib tap according to claim 1 substantially as described and illustrated with reference to the accompanying drawing.

Dated this 23rd day of May, 1946.

MEWBURN, ELLIS & CO.,
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Chartered Patent Agents.

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[This Drawing is a reproduction of the Original on a reduced scale.]

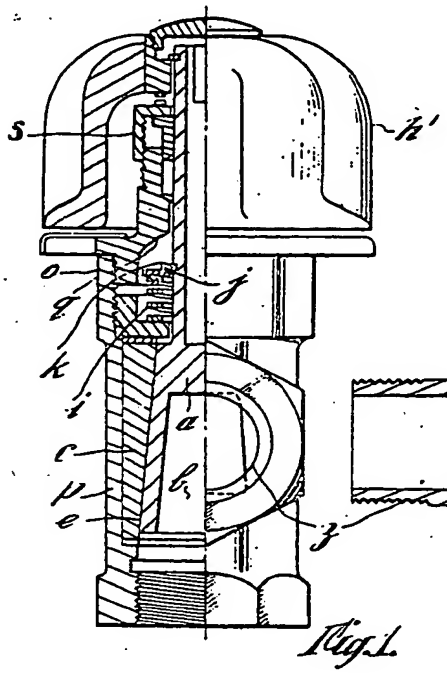

Fig. 1.

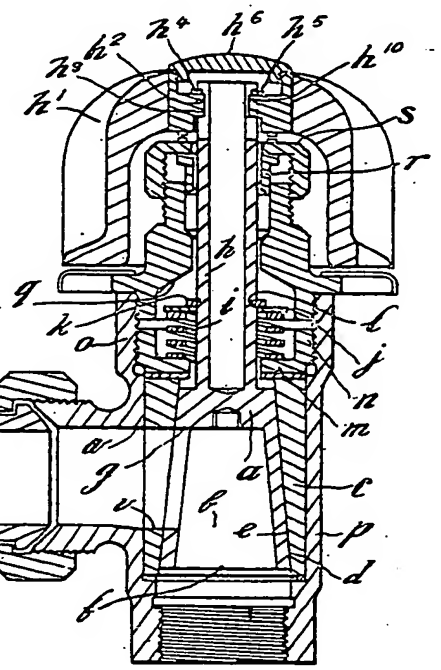

Fig. 2.

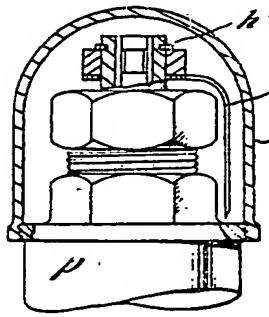

Fig. 4.

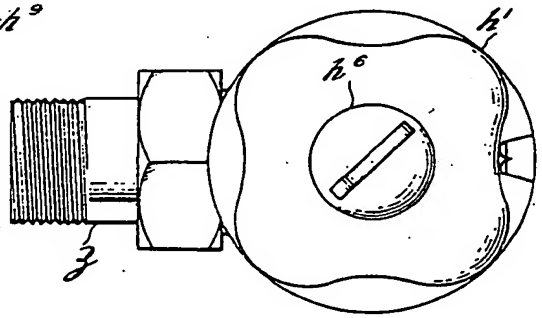

Fig. 3.

H.M.S.O. (Ty. P.)